

**PACIFIC WHITE-SIDED DOLPHIN (*Lagenorhynchus obliquidens*):
North Pacific Stock**

STOCK DEFINITION AND GEOGRAPHIC RANGE

The Pacific white-sided dolphin is found throughout the temperate North Pacific Ocean, north of the coasts of Japan and Baja California, Mexico. In the eastern North Pacific the species occurs from the southern Gulf of California, north to the Gulf of Alaska, west to Amchitka in the Aleutian Islands, and is rarely encountered in the southern Bering Sea. The species is common both on the high seas and along the continental margins, and animals are known to enter the inshore passes of Alaska, British Columbia, and Washington (Ferrero and Walker 1996)

The following information was considered in classifying Pacific white-sided dolphin stock structure based on the Dizon et al. (1992) phylogeographic approach: 1) Distributional data: geographic distribution is continuous; 2) Population response data: unknown; 3) Phenotypic data: two morphological forms are recognized (Walker et al. 1986, Chivers et al. 1993); and 4) Genotypic data: preliminary genetic analyses on 116 Pacific white-sided dolphin collected in four areas (Baja California, the U.S. west coast, British Columbia/southeast Alaska, and offshore) were not statistically significant to support phylogeographic partitioning, though they support the hypothesis that animals from the different regions are sufficiently isolated to treat them as separate management units (Lux et al. 1997). Given this limited information, stock structure throughout the North Pacific is poorly defined, but a northern form occurs north of about 33°N from southern California along the coast to Alaska, a southern form ranges from about 36°N southward along the coasts of California and Baja California while the core of the population ranges across the North Pacific to Japan at latitudes south of 45°N. Data are lacking to determine whether this latter group might include animals from one or both of the coastal forms. However, because the California and Oregon thresher shark/swordfish drift gillnet fishery (operating between 33°N and approximately 47°N) and, to a lesser extent, the groundfish and salmon fisheries in Alaska are known to interact with Pacific white-sided dolphins, two management stocks are recognized: 1) the California/Oregon/Washington stock, and 2) the North Pacific stock (Fig. 22). The California/Oregon/Washington stock is reported separately in the Stock Assessment Reports for the Pacific Region.

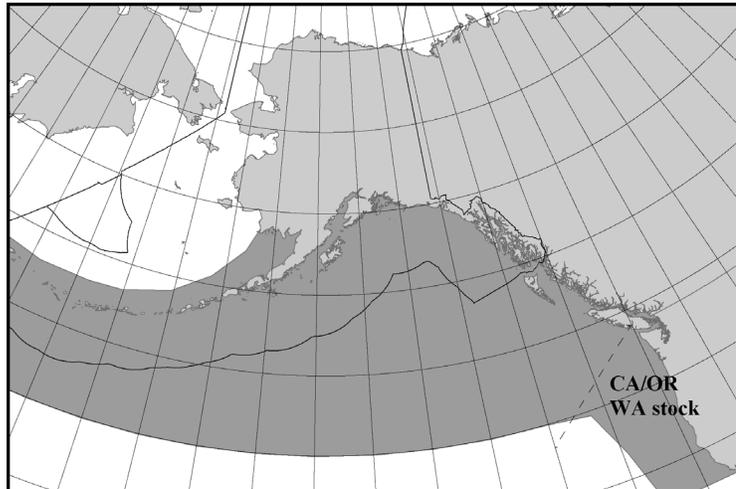


Figure 22. Approximate distribution of Pacific white-sided dolphins in the eastern North Pacific (shaded area).

POPULATION SIZE

The most complete population abundance estimate for Pacific white-sided dolphins was calculated from line transect analyses applied to the 1987-90 central North Pacific marine mammal sightings survey data (Buckland et al. 1993). The Buckland et al. (1993) abundance estimate, 931,000 (CV = 0.90) animals, more closely reflects a range-wide estimate rather than one that can be applied to either of the two management stocks off the west coast of North America. Furthermore, Buckland et al. (1993) suggested that Pacific white-sided dolphins show strong vessel attraction but that a correction factor was not available to apply to the estimate. While the Buckland et al. (1993) abundance estimate is not considered appropriate to apply to the management stock in Alaskan waters, the portion of the estimate derived from sightings north of 45°N in the Gulf of Alaska can be used as the population estimate for this area (26,880). For comparison, Hobbs and Lerczak (1993) estimated 15,200 Pacific white-sided dolphins in the Gulf of Alaska based on a single sighting of 20 animals. Small cetacean aerial surveys in the Gulf of Alaska during 1997 sighted one group of 164 Pacific white-sided dolphins off Dixon entrance, while similar surveys in Bristol Bay in 1999 made 18 sightings of a school or parts thereof off Port Moller (R. Hobbs, pers. comm., National Marine Fisheries Service).

Minimum Population Estimate

The minimum population estimate (N_{MIN}) for this stock is 26,880, based on the sum of abundance estimates for 4 separate $5 \times 5^\circ$ blocks north of 45°N ($1,970+6,427+6,101+12,382 = 26,880$) reported in Buckland et al. (1993). This is considered a minimum estimate because the abundance of animals in a fifth 5° by 5° block (53,885) which straddled the boundary of the two coastal management stocks were not included in the estimate for the North Pacific stock and because much of the potential habitat for this stock was not surveyed between 1987 - 1990.

Current Population Trend

At present, there is no reliable information on trends in abundance for this stock of Pacific white-sided dolphin.

CURRENT AND MAXIMUM NET PRODUCTIVITY RATES

A reliable estimate of the maximum net productivity rate is not currently available for the Central North Pacific stock of Pacific white-sided dolphin. Recent life history analyses by Ferrero and Walker (1996) suggest a reproductive strategy consistent with the delphinid pattern on which the 4% cetacean maximum net productivity rate (R_{MAX}) was based. Thus, it is recommended that the cetacean maximum net productivity rate (R_{MAX}) of 4% be employed for this stock (Wade and Angliss 1997).

POTENTIAL BIOLOGICAL REMOVAL

Under the 1994 reauthorized Marine Mammal Protection Act (MMPA), the potential biological removal (PBR) is defined as the product of the minimum population estimate, one-half the maximum theoretical net productivity rate, and a recovery factor: $\text{PBR} = N_{\text{MIN}} \times 0.5R_{\text{MAX}} \times F_{\text{R}}$. The recovery factor (F_{R}) for this stock is 0.5, the value for cetacean stocks of unknown status (Wade and Angliss 1997). Thus, for the North Pacific stock of Pacific white-sided dolphin, PBR would be 269 animals ($26,880 \times 0.02 \times 0.5$). Wade and Angliss (1997) recommend that abundance estimates older than 8 years no longer be used to calculate a PBR level. In addition, there is no corroborating evidence from recent surveys in Alaska that provide abundance estimates for a portion of the stock's range or any indication of the current status of this stock. Thus, the PBR for this stock is undefined.

ANNUAL HUMAN-CAUSED MORTALITY AND SERIOUS INJURY

Fisheries Information

Between 1978 and 1991, thousands of Pacific white-sided dolphins were killed annually incidental to high seas fisheries. However, these fisheries have not operated in the central North Pacific since 1991.

Six different commercial fisheries in Alaska that could have interacted with Pacific white-sided dolphins were monitored for incidental take by NMFS observers from 1990 to 1998: Bering Sea (and Aleutian Islands) and Gulf of Alaska groundfish trawl, longline, and pot fisheries. For the fisheries with observed takes, the range of observer coverage over the 9-year period, as well as the annual observed and estimated mortalities are presented in Table 20. The mean annual (total) mortality was 0 in the Bering Sea groundfish trawl fishery and 0.8 ($\text{CV} = 1.0$) in the Bering Sea groundfish longline fishery. Combining the estimates results in a mean annual (total) mortality rate of 1 (rounded up from 0.8) Pacific white-sided dolphin in observed fisheries.

The Prince William Sound salmon drift gillnet fishery was also monitored by observers in 1990 and 1991. In 1990, observers boarded 300 (57.3%) of the 524 vessels participating in that fishery, monitoring a total of 3,166 sets, or roughly 4% of the estimated number of sets made by the fleet (Wynne et al. 1991). In 1991, observers boarded 531 (86.9%) of the 611 registered vessels and monitored a total of 5,875 sets, or roughly 5% of the estimated sets made by the fleet (Wynne et al. 1992). The low level of observer coverage for this fishery apparently missed interaction with Pacific-white sided dolphins which had occurred, as logbook mortalities were reported in both years (see Table 20) which were not recorded by the observer program.

An additional source of information on the number of Pacific white-sided dolphins killed or injured incidental to commercial fishery operations is the self-reported fisheries information required of vessel operators by the MMPA. During the period from 1990 to 1998, fisher self-reports from 3 unobserved fisheries (see Table 20) resulted in an annual mean of 2.25 mortalities from interactions with commercial fishing gear. It is unclear exactly which Bristol Bay fishery caused the 1990 mortalities because the logbook records from the Bristol Bay set and drift gillnet fisheries were combined. They have been attributed to the Bristol Bay drift gillnet fishery due to the more pelagic nature of the fishery. However, because logbook records (i.e., the self-reports required during 1990-94) are most likely negatively biased

(Credle et al. 1994), these are considered to be minimum estimates. These totals are based on all available logbook reports for all Alaska fisheries. Logbook data are available for part of 1989-1994, after which incidental mortality reporting requirements were modified. Under the new system, logbooks are no longer required; instead, fishers provide self-reports. Data for the 1994-95 phase-in period is fragmentary. After 1995, the level of reporting dropped dramatically, such that the records are considered incomplete and estimates of mortality based on them represent minimums (see Appendix 7 for details).

Note that no observers have been assigned to several of the gillnet fisheries that are known to interact with this stock, making the estimated mortality unreliable. However, because the stock size is large, it is unlikely that unreported mortalities from those fisheries would be significant. The estimated minimum annual mortality rate incidental to commercial fisheries (4; based on observer data (rounded up to 1) and fisher self-reports (rounded up to 3) where observer data were not available) is less than 10% of the PBR (269). The estimated annual mortality, therefore, can be considered insignificant and approaching zero.

Table 20. Summary of incidental mortality of Pacific white-sided dolphins (North Pacific stock) due to commercial fisheries from 1990 through 1998 and calculation of the mean annual mortality rate. Mean annual mortality in brackets represents a minimum estimate from fisher self-reports. Data from 1994 to 1998 are used in the mortality calculation when more than 5 years of data are provided for a particular fishery. n/a indicates that data are not available.

Fishery name	Years	Data type	Range of observer coverage	Observed mortality (in given yrs.)	Estimated mortality (in given yrs.)	Mean annual mortality
Bering Sea/Aleutian Is. (BSAI) groundfish trawl	94-98	obs data	53-74%	0, 0, 0, 0, 0	0, 0, 0, 0, 0	0
BSAI groundfish longline (incl. misc. finfish and sablefish fisheries)	94-98	obs data	27-80%	0, 1, 0, 0, 0	0, 4, 0, 0, 0	0.8 (CV = 1.0)
Observer program total						0.8
				Reported mortalities		
Prince William Sound salmon drift gillnet	90-01	logbooks/ self-reports	n/a	1, 4, 0, 0, n/a, n/a, n/a, n/a, n/a, n/a, n/a, n/a	n/a	[≥1.25]
Southeast Alaska salmon drift gillnet	90-01	logbooks/ self-reports	n/a	0, 0, 1, 0 n/a, n/a, n/a, n/a, n/a, n/a, n/a, n/a	n/a	[≥.25]
Bristol Bay salmon drift gillnet	90-01	logbooks/ self-reports	n/a	3, 0, 0, 0 n/a, n/a, n/a, n/a, n/a, n/a, n/a, n/a	n/a	[≥.75]
Minimum total annual mortality						3.05

Subsistence/Native Harvest Information

There are no reports of subsistence take of Pacific white-sided dolphins in Alaska.

STATUS OF STOCK

Pacific white-sided dolphins are not listed as “depleted” under the MMPA or listed as “threatened” or “endangered” under the Endangered Species Act. Based on currently available data, the level of human-caused mortality and serious injury (4) exceeds the PBR (0). Therefore, the North Pacific stock of Pacific white-sided dolphins is classified as a strategic stock. Population trends and status of this stock relative to OSP are currently unknown.

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